UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Analyses and Descriptions of Geochemical Samples, Rough Mountain Roadless Area, Alleghany and Bath Counties, Virginia

by

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This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.

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STUDIES RELATED TO WILDERNESS

Roadless Areas

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey (USGS) and the U.S. Bureau of Mines to survey certain areas on Federal lands in order to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the analytical results of a geochemical survey of the Rough Mountain Roadless Area (08-040) in the George Washington National Forest, Alleghany and Bath Counties, Virginia. This area was classified as a proposed wilderness area during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January, 1979, and designated a wilderness study area by the Virginia Wilderness Act of 1984, Public Law 98-586, October, 1984.

Abstract

Semiquantitative spectrographic analyses for 31 elements on 38 stream-sediment and 45 rock samples from the Rough Mountain Roadless Area, Alleghany and Bath Counties, Va. (Fig. 1), are reported here in detail. Atomic-absorption analyses for zinc in all samples are also reported. Rocks analyzed include sandstone, siltstone and shale and a brief description of each rock sample is included. The data include no obviously anomalous concentrations that might be related to mineralized rock. Localities for all samples are given in Universal Transverse Mercator (UTM) coordinates.

INTRODUCTION

The analyses presented in this report (Table 1) are of 38 stream-sediment and 45 rock samples from the Rough Mountain Roadless Area, Alleghany and Bath Counties, Va. These were collected by F. G. Lesure,

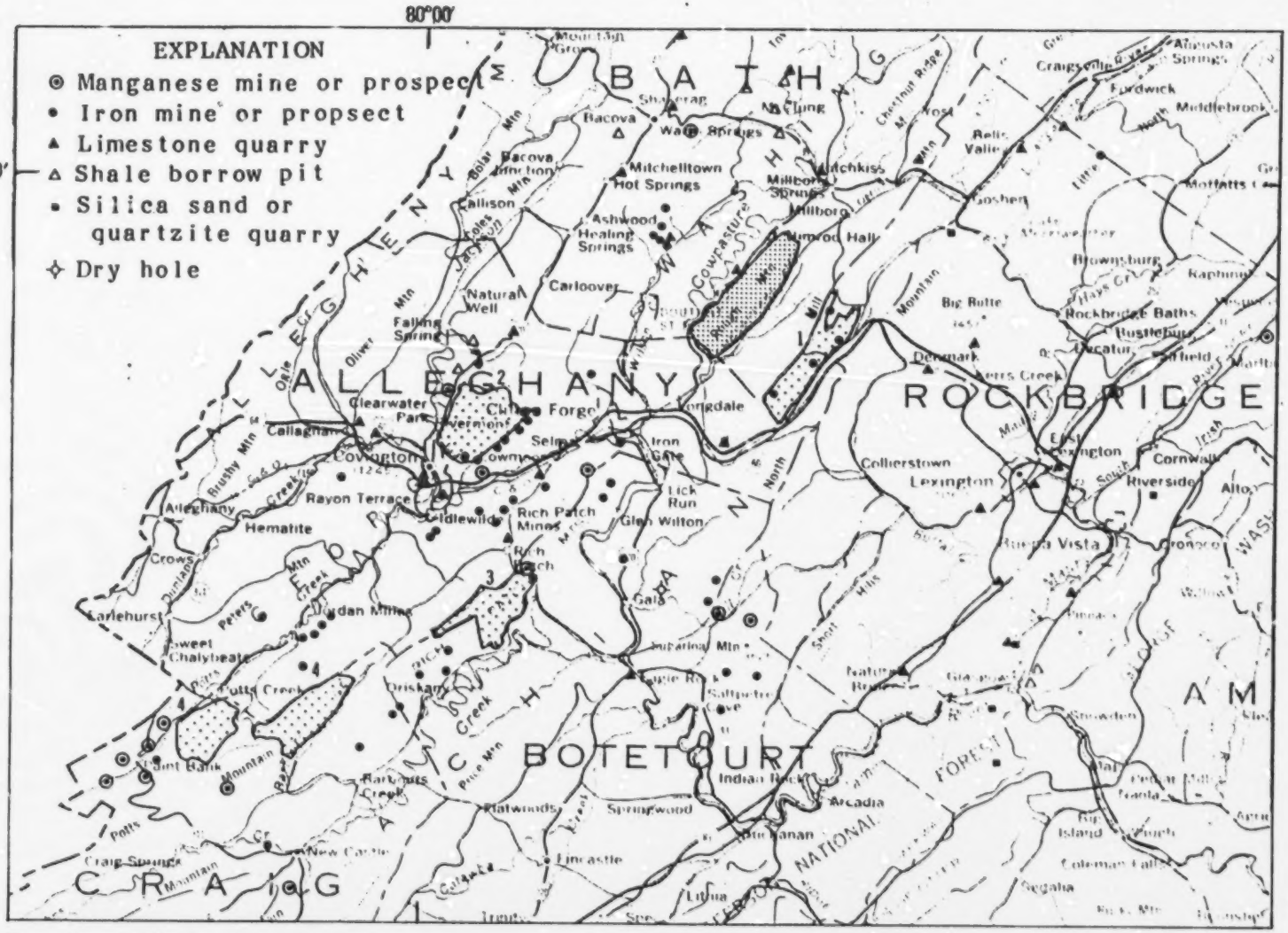

Figure 1.-- Index map showing location of Rough Mountain Roadless Area.

S. W. Nicholson and S. M. Heinrich in April 1984. Stream sediment samples were collected from most of the small drainage basins in the study area. These represent several handfuls, randomly collected, of the finest sediment available at the sample site in the stream. Rock samples analyzed are described briefly in a separate section of this report. All are chip samples taken across bedding or layering over a measured thickness and are representative of the major rock types exposed in the area. Some of the rock is partly weathered, but generally the freshest material available was sampled. Maps showing sample localities and discussion of the results of the analytical work are given by Lesure and Nicholson (in press).

ANALYTICAL TECHNIQUES

Each sample was analyzed semiquantitatively for 31 elements by means of a six-step, D.C. (direct-current) arc, optical-emission spectrographic method (Grimes and Marranzino, 1968) by E. A. Bailey in the USGS laboratories, Denver, Colorado. In addition, each sample was analyzed for zinc by an atomic-absorption technique (Ward and others, 1969, p.20) by J. D. Sharkey and Marianne Walter, USGS laboratories, Denver, Colorado. The semiquantitative spectrographic values are reported as six steps per order of magnitude (1, 0.7, 0.5, 0.3, 0.2, 0.15 or multiples of ten of these numbers) and are approximate geometric midpoints of the concentration ranges. The expected precision is within one adjoining reporting interval on each side of the reported value 83 percent of the time and within two adjoining intervals 96 percent of the time (Motooka and Grimes, 1976). Three rock samples were analyzed for uranium by fluorometric methods by T. A. Roemer, USGS laboratories, Denver, Colo.

The visual lower limits of determination for the 31 elements that were determined spectrographically are as follows:

For those given in percent:

Calcium	0.05
Iron	0.05
Magnesium	0.02
Titanium	0.002

For those given in ppm:

Antimony	100	Molybdenum	5
Arsenic	200	Nickel	5
Barium	20	Niobium	20
Beryllium	1	Scandium	5
Bismuth	10	Silver	0.5
Boron	10	Strontium	100
Cadmium	20	Thorium	100
Chromium	10	Tin	10
Cobalt	5	Tungsten	50
Copper	5	Vanadium	10
Gold	10	Yttrium	10
Lanthanum	20	Zinc	200
Lead	10	Zirconium	10
Manganese	10		

ROCK DESCRIPTIONS

Sample No.	Description
VRM 001	1-m chip sample, grayish-red, very fine-grained quartzitic sandstone. Jennings Formation.
VRM 002	1-m chip sample, brownish-gray, very fine-grained quartzitic sandstone; some fossils. Jennings Formation.
VRM 004	1-m chip sample, pale-yellowish-brown, massive shale; weathers to moderate-yellowish-brown. Jennings Formation.
VRM 005	1-m chip sample, brownish-gray to medium-dark-gray, micaceous siltstone; minor opaque grains. Jennings Formation.
VRM 006	1-m chip sample, light-olive-gray to dark-yellowish-brown shale. Jennings Formation.
VRM 007	1-m chip sample, conglomerate, white to medium-gray quartz pebbles, as much as 2 1/2 cm in diameter; fine-grained, light-brown siltstone matrix. Jennings Formation.
VRM 008	2-m chip sample, black to dark-gray shale and medium-gray, fine-grained, sandstone; weathers moderate-brown. Jennings Formation.
VRM 009	1-m chip sample, medium-dark-gray to medium-light-gray, micaceous siltstone and shale. Jennings Formation.
VRM 012	2-m chip sample, dark-gray to black, fissile shale; some sulfides, weathers darkish-red. Romney Shale.
VRM 019	1-m chip sample, light-olive-gray to medium-gray, massive siltstone; fossiliferous. Jennings Formation.
VRM 022	1-m chip sample, medium-dark-gray to olive-gray, well-laminated, micaceous shale; weathers light-brown. Jennings Formation.
VRM 026	2-m chip sample, medium-dark-gray, massive, micaceous mudstone. Romney Shale.
VRM 034	2-m chip sample, medium-dark-gray shale; Jennings Formation.
VRM 046	2-m chip sample, light-olive-gray to yellowish-brown, massive siltstone. Jennings Formation.
VRM 048	1-m chip sample, light-olive-gray shale; minor amounts of mica. Jennings Formation.

VRM 049 2-m chip sample, brownish-gray, very fine-grained, massive sandstone. Jennings Formation.

VRM 101 1-m chip sample, medium-gray to olive-gray shale; minor amount of mica. Jennings Formation.

VRM 102 1-m chip sample, moderate-yellowish brown and grayish-red to very-dusky-red, laminated siltstone and massive, fine-grained sandstone. Jennings Formation

VRM 103 1-m chip sample, light-olive-gray to grayish-orange-pink, fine-grained, massive sandstone. Jennings Formation.

VRM 104 1-m chip sample, light-olive-gray to grayish-orange-pink, micaceous shale. Jennings Formation.

VRM 105 1-m chip sample, greenish-gray to medium-dark-gray, fine-grained, massive siltstone; abundant fossils. Jennings Formation.

VRM 106 1-m chip sample, light-olive-gray, micaceous siltstone. Jennings Formation.

VRM 108 1-m chip sample, medium-dark-gray, laminated siltstone; weathers pale-brown. Jennings Formation.

VRM 110 1-m chip sample, olive-gray to medium-dark-gray shale; minor mica. Jennings Formation.

VRM 111 1-m chip sample, olive-gray to brownish-gray, very fine-grained sandstone; abundant fossils, weathers pale-brown. Jennings Formation.

VRM 112 1-m chip sample, dark-yellowish-brown to pale-yellowish-brown, fissile shale. Jennings Formation.

VRM 113 1-m chip sample, olive-gray, micaceous siltstone; weathers dark-yellowish-brown. Jennings Formation.

VRM 115 1-m chip sample, medium-dark-gray, fissile shale; fossiliferous, weathers pale-brown to grayish-orange-pink. Romney Shale.

VRM 121 1-m chip sample, grayish-red to brownish-gray, very fine-grained, massive sandstone; fossiliferous. Jennings Formation.

VRM 123 1-m chip sample, medium-light-gray quartzitic siltstone; weathers olive-gray to brownish-gray. Jennings Formation.

VRM 126 1-m chip sample, grayish-red to brownish-gray, very fine-grained, massive sandstone. Jennings Formation.

VRM 128 1-m chip sample, olive-gray, massive, micaceous mudstone; weathers moderate-brown to dark-gray, fossiliferous. Jennings Formation.

VRM 130 1-m chip sample, light-olive-gray to olive-gray, very fine-grained, massive, fossiliferous sandstone-siltstone. Jennings Formation.

VRM 300 1-m chip sample, grayish-orange-pink to moderate-yellowish-brown, micaceous siltstone. Jennings Formation.

VRM 301 1-m chip sample, pale-yellowish-brown to grayish-red, very fine-grained, quarzitic sandstone-siltstone. Jennings Formation.

VRM 302 1-m chip sample, pebble conglomerate having pale-red, very fine to fine-grained sandstone matrix and well rounded, 1/2 inch, white to grayish-pink quartz pebbles. Jennings Formation.

VRM 303 1-m chip sample, medium-gray to olive-gray siltstone to fine-grained sandstone; weathers buff-tan to gray. Jennings Formation.

VRM 304 1-m chip sample, olive to medium-gray siltstone; weathers rusty to brown. Jennings Formation.

VRM 307 1-m chip sample, tan-buff and mixed red, sandy, micaceous, shale; some fossils. Jennings Formation.

VRM 311 1-m chip sample, gray to rusty-brown, fine-grained, fossiliferous sandstone. Jennings Formation.

VRM 313 1-m chip sample, medium-dark-gray, shale; weathers olive-gray. Jennings Formation.

VRM 314 1-m chip sample, brownish-gray to moderate-brown, very fine-grained, fossiliferous sandstone. Jennings Formation.

VRM 319 1-m chip sample, light-olive-gray to olive-gray, very fine-grained, quartzitic sandstone; weathers moderate-yellowish-brown. Jennings Formation.

VRM 320 1-m chip sample, medium-dark-gray to grayish-red, very fine-grained, fossiliferous sandstone. Jennings Formation.

VRM 324 1-m chip sample, moderate-yellowish-brown, fine- to medium-grained, porous, fossiliferous sandstone. Ridgeley Sandstone.

EXPLANATION OF TABLE

The X and Y coordinates are Universal Transverse Mercator (UTM) grid, zone 17. The X coordinate is the easting value, in meters; the Y is the northing, in meters.

Iron, magnesium, calcium, and titanium concentrations are reported in percent (pct); all others are in parts per million (ppm). Letters below chemical symbols indicate the method of analysis: s, six-step semiquantitative spectrographic method; aa, atomic absorption. Other symbols on the table are: N, not detected; --, not determined; <, amount detected is below the lower limit of determination, which is number shown; >, amount detected is above the upper limit of determination, which is number shown.

Elements looked for spectrographically but not found, except as noted, are listed below. The lower limits of determination for these elements are in parentheses.

For stream sediments: As (200); Au (10); Bi (10); Cd (20); Mo (5); Sb (100); Sn (10); Th (100); W (50) and Zn (200). Exceptions: Sample VRM 114 reported to contain 10 ppm Mo and sample VRM 315 reported to contain <10 ppm Mo.

For rock samples: As (200); Au (10); Bi (10); Cd (20); Mo (5); Sb (100); Sn (10); Th (100); W (50); and Zn (200). Exceptions: sample VRM 012 reported to contain 50 ppm Mo and VRM 115 reported to contain 20 ppm Mo.

REFERENCES CITED

Grimes, D. J., and Marranzino, A. P., 1968, Direct-current arc and alternating-current spark emission spectrographic field methods for the semiquantitative analysis of geologic materials: U.S. Geological Survey Circular 591, 6 p.

Lesure, F. G., and Nicholson, S. W., in press, Geology, geochemistry, and mineral survey of the Rough Mountain Roadless Area, Alleghany and Bath Counties, Virginia: U.S. Geological Survey Miscellaneous Field Studies Map MF-1811, scale 1:48,000.

Motooka, J. M., and Grimes, D. J., 1976, Analytical precision of one-sixth order semiquantitative spectrographic analysis: U.S. Geological Survey Circular 738, 25 p.

Ward, F. N., Nakagawa, H. M., Harms, T. F., and Van Sickle, G. H., 1969, Atomic-absorption methods of analysis useful in geochemical exploration: U.S. Geological Survey Bulletin 1289, 45 p.

Table 1.-- Analyses of rock and stream sediment samples

Rough Mountain Rock Samples

Sample	X coordinate	Y coordinate	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	B-ppm s	Ba-ppm s	Be-ppm s	Co-ppm s
VRM001	614,760	4,197,380	3.0	.5	.05	>1.0	300	N	200	300	1.0	15
VRM002	614,580	4,197,670	2.0	.2	.05	.7	100	N	100	200	<1.0	7
VRM004	614,960	4,197,615	3.0	.5	<.05	.5	200	N	200	500	3.0	15
VRM006	614,890	4,197,215	7.0	.7	<.05	.7	300	N	500	700	5.0	20
VRM007	614,925	4,197,170	2.0	.1	<.05	.2	1,500	N	70	500	<1.0	7
VRM008	615,600	4,196,835	5.0	1.0	.05	1.0	1,000	N	300	1,000	5.0	20
VRM009	615,840	4,196,675	5.0	1.0	.30	.7	1,000	N	200	700	2.0	20
VRM012	610,950	4,195,955	2.0	.5	.05	.5	150	1.0	500	700	5.0	5
VRM019	612,880	4,196,580	3.0	.5	.05	1.0	200	N	200	500	2.0	10
VRM022	613,200	4,196,160	5.0	.7	.05	1.0	500	N	150	700	2.0	10
VRM026	612,380	4,197,270	10.0	2.0	.70	.7	1,000	N	500	1,000	3.0	20
VRM034	614,690	4,195,045	7.0	1.5	.30	1.0	1,000	N	300	1,500	2.0	20
VRM046	611,750	4,193,460	7.0	.5	<.05	1.0	200	N	300	700	3.0	15
VRM048	612,450	4,194,885	10.0	1.0	<.05	.7	1,500	N	500	1,000	5.0	20
VRM049	612,010	4,194,815	3.0	.3	.05	1.0	700	N	150	500	1.0	15
VRM101	616,125	4,196,590	7.0	1.0	.05	1.0	300	N	200	700	3.0	20
VRM102	614,060	4,197,140	3.0	.2	.05	1.0	300	N	200	500	1.0	10
VRM103	614,890	4,197,250	2.0	.2	<.05	1.0	150	N	150	300	<1.0	5
VRM104	615,010	4,197,275	7.0	.7	.05	.7	200	<.5	300	700	3.0	20
VRM105	615,260	4,196,955	5.0	.7	.05	1.0	300	N	200	700	1.5	15
VRM106	615,480	4,196,880	7.0	1.5	.05	.7	300	N	300	1,000	5.0	15
VRM108	614,010	4,193,620	7.0	1.5	.50	1.0	700	N	300	700	3.0	20
VRM110	616,570	4,201,620	10.0	1.5	.07	1.0	700	<.5	300	1,000	3.0	20
VRM111	617,065	4,201,230	.3	.1	.05	.2	70	N	50	100	1.0	N
VRM112	616,600	4,200,015	5.0	1.0	<.05	.7	700	N	300	1,000	5.0	20
VRM113	616,215	4,200,295	5.0	.7	.05	.7	300	2.0	200	700	3.0	20
VRM115	614,590	4,199,880	3.0	.7	<.05	.5	200	N	700	1,000	3.0	10
VRM121	616,760	4,199,205	2.0	.5	.05	1.0	300	N	200	700	2.0	7
VRM123	617,560	4,199,240	7.0	1.5	.10	1.0	700	N	300	1,000	3.0	15
VRM126	611,730	4,193,490	3.0	.5	.20	.5	1,000	N	150	700	1.5	10
VRM128	611,640	4,195,510	5.0	.7	.05	1.0	200	N	200	700	2.0	10
VRM130	614,020	4,197,610	5.0	1.0	.05	1.0	700	N	300	1,000	3.0	15
VRM005	614,580	4,197,420	3.0	.7	.05	1.0	200	1.0	300	500	2.0	15
VRM300	614,520	4,196,725	3.0	.5	<.05	1.0	300	N	300	700	2.0	10
VRM301	614,500	4,196,750	3.0	.3	<.05	.7	700	N	150	700	1.5	15
VRM302	614,430	4,196,855	3.0	.2	<.05	1.0	700	N	150	1,000	1.0	10
VRM303	615,720	4,196,745	5.0	1.5	.50	.7	2,000	N	300	1,000	3.0	15
VRM304	616,240	4,196,520	7.0	2.0	.07	.7	500	N	500	1,000	3.0	20
VRM307	617,280	4,201,060	5.0	.5	<.05	1.0	1,000	N	200	700	2.0	15
VRM311	615,120	4,199,200	3.0	.3	<.05	1.0	150	N	200	1,000	1.5	N
VRM313	618,480	4,200,400	5.0	1.5	.05	.7	1,000	N	500	1,000	5.0	20
VRM314	617,365	4,200,200	3.0	.7	.05	1.0	200	N	300	1,000	1.5	7
VRM319	611,790	4,193,435	5.0	.5	.30	1.0	1,000	N	200	700	1.5	10
VRM320	612,120	4,192,720	3.0	.7	<.05	1.0	200	N	200	700	2.0	10
VRM324	613,280	4,198,360	.7	.1	.05	.2	500	N	150	500	1.0	10

Rough Mountain Rock Samples

Sample	Cr-ppm s	Cu-ppm s	La-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sc-ppm s	Sr-ppm s	V-ppm s	Y-ppm s	Zr-ppm s	Zn-ppm aa	U-INST ppm
VRM001	100	20	150	20	20	<10	15	100	100	70	>1,000	45	--
VRM002	50	<5	N	N	15	N	7	N	70	30	500	30	--
VRM004	70	50	30	N	50	<10	10	<100	100	30	150	75	--
VRM006	100	30	70	N	50	10	20	100	150	50	150	80	--
VRM007	10	10	30	N	<5	20	5	N	30	20	300	20	--
VRM008	70	20	50	N	50	50	20	100	150	50	200	85	--
VRM009	70	15	N	N	50	<10	15	<100	100	50	200	75	--
VRM012	70	30	30	N	70	10	20	<100	700	50	100	95	4.30
VRM019	70	10	N	<20	20	20	10	<100	100	50	300	55	--
VRM022	70	20	70	<20	30	70	10	100	100	50	700	75	--
VRM026	150	30	50	N	70	10	20	<100	150	30	100	60	.55
VRM034	100	15	50	<20	50	20	15	100	100	50	200	60	--
VRM046	70	30	70	20	50	<10	15	<100	100	70	700	55	--
VRM048	150	30	70	<20	50	20	20	<100	150	50	150	90	--
VRM049	50	7	50	N	20	10	7	N	50	50	500	50	--
VRM101	100	20	50	N	50	10	15	100	100	50	200	70	--
VRM102	70	7	N	N	10	N	7	<100	70	30	700	50	--
VRM103	30	<5	N	N	10	N	5	N	70	70	700	30	--
VRM104	100	50	70	N	50	30	15	<100	100	50	150	90	--
VRM105	70	20	N	N	20	30	10	<100	100	50	500	80	--
VRM106	100	<5	70	N	50	<10	15	100	150	50	100	65	--
VRM108	100	7	50	N	50	<10	15	100	100	50	150	85	--
VRM110	100	10	50	N	70	<10	15	100	100	50	150	60	--
VRM111	10	<5	30	N	N	N	N	N	30	15	100	35	--
VRM112	100	20	50	N	50	20	20	100	150	50	100	90	--
VRM113	70	30	N	<20	30	10	15	<100	100	30	100	85	--
VRM115	100	100	50	N	70	50	20	<100	700	30	70	80	2.30
VRM121	70	7	30	N	10	50	10	<100	70	30	300	60	--
VRM123	100	10	30	<20	50	15	15	<100	100	50	150	80	--
VRM126	30	5	N	N	15	<10	7	N	70	30	200	50	--
VRM128	70	10	30	N	15	15	15	<100	100	50	500	40	--
VRM130	70	20	50	N	50	10	15	<100	100	30	200	60	--
VRM005	70	10	N	N	30	10	15	<100	70	50	300	65	--
VRM300	70	30	50	N	30	15	15	N	150	50	300	60	--
VRM301	50	<5	30	N	20	<10	10	N	50	70	500	70	--
VRM302	50	100	70	N	15	20	7	N	70	30	1,000	30	--
VRM303	70	15	30	N	50	10	15	100	100	50	200	70	--
VRM304	150	50	70	N	50	20	20	100	100	50	150	70	--
VRM307	70	100	50	N	50	20	15	N	100	50	300	60	--
VRM311	70	30	N	N	7	20	10	<100	70	50	500	30	--
VRM313	50	50	70	N	50	10	20	100	100	30	100	80	--
VRM314	70	10	50	N	20	50	10	100	70	50	500	55	--
VRM319	50	7	70	N	20	<10	10	<100	70	70	1,000	45	--
VRM320	70	10	50	N	20	50	10	<100	100	30	500	75	--
VRM324	50	7	50	N	15	10	5	N	70	20	150	20	--

Rough Mountain Stream Sediment Samples

Sample	X coordinate	Y coordinate	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	B-ppm s	Ba-ppm s	Be-ppm s	Co-ppm s
VRM010	614,090	4,194,250	3.0	.5	.20	1.0	2,000	N	300	1,000	3	20
VRM011	613,860	4,193,880	3.0	.7	.05	1.0	1,500	N	300	1,000	3	20
VRM024	612,700	4,197,000	3.0	.5	.10	1.0	1,500	N	300	1,000	3	20
VRM025	612,660	4,197,000	2.0	.5	.07	.7	1,500	.5	200	1,000	3	20
VRM028	612,780	4,197,745	1.5	.5	.10	.7	1,500	N	150	700	3	15
VRM030	611,470	4,196,275	1.5	.5	.30	.7	1,500	1.0	200	1,000	3	15
VRM031	610,780	4,195,140	2.0	.5	.30	1.0	3,000	N	200	1,000	5	30
VRM033	614,860	4,194,690	3.0	.7	.15	1.0	2,000	N	300	1,000	5	20
VRM035	614,840	4,194,660	3.0	.5	.15	1.0	2,000	N	200	1,000	3	20
VRM036	615,395	4,195,060	2.0	.5	.15	1.0	2,000	N	200	1,000	3	15
VRM039	615,780	4,195,615	2.0	.5	.15	1.0	1,500	N	200	1,000	3	15
VRM040	615,900	4,195,920	3.0	.7	.10	1.0	2,000	N	300	1,000	5	20
VRM027	612,465	4,197,490	3.0	.5	.10	1.0	2,000	N	200	1,000	3	20
VRM107	616,240	4,196,520	3.0	.5	.07	1.0	1,500	N	300	1,000	3	15
VRM109	613,800	4,193,330	2.0	.7	.10	1.0	3,000	<.5	200	1,000	3	20
VRM114	615,850	4,201,500	1.5	.5	.05	1.0	300	3.0	300	1,500	3	5
VRM116	614,830	4,199,960	2.0	.5	.07	1.0	2,000	N	200	1,000	3	15
VRM117	613,740	4,198,710	2.0	.5	.10	1.0	1,500	N	200	1,000	3	15
VRM118	618,190	4,199,980	3.0	.7	.10	1.0	2,000	N	300	1,000	5	20
VRM119	618,200	4,199,940	3.0	.7	.10	.7	3,000	N	500	1,000	5	20
VRM120	618,030	4,199,410	3.0	.5	.07	1.0	2,000	N	300	700	5	20
VRM122	617,560	4,198,240	5.0	.7	.07	1.0	2,000	N	500	1,000	3	20
VRM124	617,375	4,197,845	3.0	.7	.10	1.0	3,000	N	500	1,000	5	20
VRM125	616,390	4,197,140	3.0	.7	.07	1.0	2,000	N	500	1,000	3	20
VRM127	612,190	4,192,740	2.0	.5	.20	.7	1,500	N	200	700	3	15
VRM305	613,740	4,193,090	2.0	.5	.15	1.0	2,000	N	300	1,000	5	20
VRM306	616,320	4,201,820	5.0	.7	.07	1.0	2,000	N	500	700	5	20
VRM308	615,980	4,201,050	2.0	.7	.10	.7	1,500	N	200	1,000	3	15
VRM309	615,395	4,200,690	2.0	.5	.20	.7	2,000	N	200	1,000	3	20
VRM310	614,580	4,199,860	5.0	.7	.15	1.0	2,000	N	500	1,000	3	20
VRM312	618,480	4,200,400	5.0	.7	.15	1.0	2,000	3.0	500	1,000	3	20
VRM315	618,160	4,199,960	7.0	.7	.20	1.0	2,000	N	500	1,000	5	30
VRM316	617,820	4,198,555	5.0	.7	.20	1.0	3,000	N	500	1,000	3	30
VRM317	617,680	4,198,410	3.0	.7	.15	1.0	1,500	N	300	1,000	3	20
VRM318	610,170	4,193,965	3.0	.5	.20	1.0	2,000	N	200	1,000	3	15
VRM321	611,320	4,192,740	7.0	1.0	.20	>1.0	2,000	N	500	1,000	2	30
VRM322	610,960	4,195,835	3.0	.5	.20	1.0	2,000	N	300	1,000	3	20
VRM323	613,410	4,198,275	3.0	.7	.15	>1.0	1,500	N	300	1,000	3	20

Rough Mountain Stream Sediment Samples

Sample	Cr-ppm s	Cu-ppm s	La-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sc-ppm s	Sr-ppm s	V-ppm s	Y-ppm s	Zr-ppm s	Zn-ppm aa	U-INST
VRM010	70	30	50	N	30	50	15	100	150	50	300	70	--
VRM011	70	30	50	<20	30	50	15	100	150	50	500	70	--
VRM024	70	30	50	<20	50	30	15	100	150	50	500	80	--
VRM025	70	20	30	N	20	50	15	<100	100	30	200	70	--
VRM028	70	30	N	N	30	70	15	<100	100	50	150	150	--
VRM030	70	30	N	N	20	100	15	100	100	30	100	85	--
VRM031	70	30	N	N	50	50	15	100	100	50	300	150	--
VRM033	100	30	N	N	30	50	15	150	100	50	200	85	--
VRM035	100	30	N	N	30	70	15	150	100	50	150	75	--
VRM036	70	30	50	N	20	70	15	150	100	30	200	75	--
VRM039	70	30	30	N	20	70	10	100	70	30	150	75	--
VRM040	100	30	50	N	30	70	15	150	100	30	150	95	--
VRM027	70	30	50	N	30	70	10	<100	100	30	300	90	--
VRM107	100	30	50	N	20	50	10	<100	100	30	200	80	--
VRM109	100	30	N	N	30	70	10	<100	100	30	200	95	--
VRM114	100	50	50	N	20	50	15	<100	200	30	150	80	--
VRM116	100	20	N	N	30	50	15	<100	100	30	200	75	--
VRM117	70	20	N	N	20	30	10	<100	100	30	200	75	--
VRM118	100	30	N	N	30	20	15	100	100	30	200	100	--
VRM119	70	50	50	N	50	100	20	100	150	50	200	100	--
VRM120	70	30	N	N	30	70	15	100	150	50	200	80	--
VRM122	70	30	N	N	50	70	20	150	200	50	200	75	--
VRM124	70	30	30	N	50	70	20	150	150	50	300	75	--
VRM125	70	30	50	N	50	100	15	100	150	50	300	80	--
VRM127	70	20	N	N	30	70	15	100	100	50	150	95	--
VRM305	50	20	30	N	30	30	15	100	100	50	150	90	--
VRM306	70	30	30	N	50	100	20	100	150	50	200	80	--
VRM308	70	20	50	N	30	100	15	100	100	50	150	100	--
VRM309	50	30	30	N	50	70	10	<100	100	50	200	190	--
VRM310	50	30	30	N	50	70	20	100	150	50	300	120	--
VRM312	70	20	30	N	50	50	20	<100	150	50	200	85	--
VRM315	70	30	50	N	70	20	20	100	200	50	300	100	--
VRM316	70	30	50	N	70	70	20	100	150	50	200	100	--
VRM317	70	30	50	N	50	100	15	<100	200	50	200	85	--
VRM318	50	20	30	N	20	70	15	<100	100	30	200	75	--
VRM321	100	30	50	<20	50	20	20	100	200	50	500	75	--
VRM322	70	30	50	N	50	70	15	150	150	50	150	130	--
VRM323	100	30	50	<20	50	70	20	100	150	50	200	85	--